WHAT IS CLAIMED IS:

1. A piston assembly for use in an engine, comprising:

a piston body including a crown with a skirt extending from the crown, said skirt having an exterior surface;

said exterior surface having a surface finish in a wave form with peaks and valleys, and having a roughness total (Rt) between approximately 6 and 8 micrometers, said roughness total defined as the difference between the highest peak and lowest valley within an assessment length;

said surface finish having an approximate peak-to-peak distance between 0.18 and 0.23 mm within the assessment length; and

a composite coating on said exterior surface.

2. The piston assembly of claim 1, wherein said composite coating comprises a composite polymer coating (CPC) between approximately 10 and 16 micrometers in thickness.

3. The piston assembly of claim 2, wherein said composite polymer coating (CPC) comprises a polyamide resin having between approximately 5% and 30% by volume graphite particles.

4. The piston assembly of claim 2, wherein said composite polymer coating (CPC) comprises a polyamide resin having between approximately 2% and 10% by volume graphite particles and between approximately 2% and 20% by volume molybdenum disulfide particles.

5. The piston assembly of claim 4, wherein said graphite and molybdenum disulfide particles comprise fibers with a length between approximately 3 and 15 micrometers, and a diameter of approximately 1 to 5 micrometers.

6. The piston assembly of claim 1, wherein said composite coating comprises a Ni-P-BN plated coating.

7. The piston assembly of claim 6, wherein said coating comprises approximately 5% by volume BN and approximately 3% by weight phosphorus.

8. The piston assembly of claim 6, wherein said coating has a thickness between approximately 12 and 17 micrometers and an approximate hardness of 50 HRC, said coating being electroplated and having suspended ceramic particulate in the electroplating solution co-deposited during electroplating.

9. The piston assembly of claim 1, wherein said roughness total is approximately 7 micrometers.

10. The piston assembly of claim 1, wherein said approximate peak-to-peak distance is approximately 0.22 micrometers.

11. The piston assembly of claim 1, wherein said surface finish is formed by turning with a diamond-tipped cutting insert.

12. The piston assembly of claim 1, further comprising a cast-iron cylinder bore configured to receive the piston body, said bore having a bore surface with a roughness average (Ra) between approximately 0.34 and 0.52 micrometers.

13. A piston and cylinder assembly for an engine, the piston including a piston body having a crown with a skirt extending from the crown, wherein the skirt has an exterior surface, and the cylinder being a cast-iron cylinder bore configured to receive the piston body and having a bore surface, the piston and cylinder assembly comprising:

said exterior surface having a surface finish in a wave form with peaks and valleys, and having a roughness total (Rt) between approximately 6 and 8 micrometers, said roughness total defined as the difference between the highest peak and lowest valley within an assessment length;

said surface finish having an approximate peak-to-peak distance between 0.18 and 0.23 mm within the assessment length;

a composite coating on said exterior surface; and

said bore surface having a roughness average (Ra) between approximately 0.34 and 0.52 micrometers.

14. The piston and cylinder assembly of claim 13, wherein said composite coating comprises a composite polymer coating (CPC) between approximately 10 and 16 micrometers in thickness.

15. The piston and cylinder assembly of claim 13, wherein said composite coating comprises a Ni-P-BN plated coating.

16. The piston and cylinder assembly of claim 13, wherein said roughness total is approximately 7 micrometers.

17. The piston and cylinder assembly of claim 13, wherein said approximate peak-to-peak distance is approximately 0.22 micrometers.

18. A method of manufacturing a piston and cast-iron cylinder bore of an engine, the piston including a piston body having a crown with a skirt extending form the crown, and the cylinder configured to receive the piston body, the method comprising:

finishing an exterior surface of the skirt in a turning operation with a transverse feed rate of between approximately 0.18 and 0.23 mm/revolution;

applying a composite coating to the finished exterior surface; and

honing a bore surface of the cylinder bore to form a roughness average (Ra) between approximately 0.34 and 0.52 micrometers.

19. The method of claim 18, wherein said transverse feed rate is approximately 0.22 mm/revolution.

20. The method of claim 18, wherein said composite coating is a composite polymer coating.

21. The method of claim 18, wherein said composite coating is a nickel-ceramic composite coating.